

## APPENDIX D

**RISK MANAGEMENT AND FRATRICIDE AVOIDANCE**

*The primary objective of risk management and fratricide avoidance is to help units protect their combat power through accident prevention, enabling them to win the battle quickly and decisively with minimum losses. This appendix focuses on two topics: risk management and the avoidance of fratricide. Risk is the chance of injury or death for individuals and of damage to or loss of vehicles and equipment. Risk, or the potential for risk, is always present in every combat and training situation. Risk management must take place at all levels of the chain of command during each phase of every operation; it is an integral part of planning. The battalion task force commander, company team commanders, staff, and all soldiers must know how to use risk management, coupled with fratricide avoidance measures, to ensure the TF executes the mission in the safest possible environment within mission constraints. (For additional information on risk management, refer to FM 100-14.)*

**Section I. RISK MANAGEMENT**

Risk management is the process of identifying and controlling hazards to conserve combat power and resources. Leaders (to include the staff) must always remember that the effectiveness of the process depends on never approaching risk management with “one size fits all” solutions to the hazards their units face. They must consider the essential tactical and operational factors that make each situation unique. There are five steps of risk management. This five-step process is integrated into the military decision-making process (Table D-1, page D-2).

Military Decision-Making Process	Risk Management Steps				
	Step 1 Identify Hazards	Step 2 Assess Hazards	Step 3 Develop Controls and Make Risk Decisions	Step 4 Implement Controls	Step 5 Supervise and Evaluate
Mission Receipt	X				
Mission Analysis	X	X			
COA Development	X	X	X		
COA Analysis	X	X	X		
COA Comparison			X		
COA Approval			X		
Orders Production				X	
Rehearsal <sup>1</sup>	X	X	X	X	X
Execution and Assessment <sup>1</sup>	X	X	X	X	X
<sup>1</sup> All boxes are marked to emphasize the continued use of the risk management process throughout the mission.					

**Table D-1. Risk management steps correlated with MDMP tasks.**

#### **D-1. STEP 1, IDENTIFY HAZARDS**

A hazard is a source of danger. It is any existing or potential condition that could result in injury, illness, or death of personnel; damage to or loss of equipment and property; or some other form of mission degradation. Hazards arise in both tactical and training operations. Leaders must identify the hazards associated with all aspects and phases of the mission, paying particular attention to the factors of METT-TC. Risk management must never be an afterthought; leaders must begin the process during MDMP (troop-leading procedures for company team and below) and continue it throughout the operation. Table D-2 lists possible sources of risk the battalion task force might face during a typical tactical operation. The list is organized according to the factors of METT-TC.

<b>SOURCES OF BATTLEFIELD RISK</b>
<b>MISSION</b> Duration of the operation. Complexity or clarity of the plan. (Is the plan well developed and easily understood?) Proximity and number of maneuvering units.
<b>ENEMY</b> Knowledge of the enemy situation. Enemy capabilities. Availability of time and resources to conduct reconnaissance.
<b>TERRAIN AND WEATHER</b> Visibility conditions, including light, dust, fog, and smoke. Precipitation and its effects on mobility. Extreme heat or cold. Additional natural hazards (broken ground, steep inclines, and water obstacles).
<b>TROOPS AND SUPPORT AVAILABLE</b> Equipment status. Morale. Experience units conducting the operation have working together. Soldier and leader proficiency. Soldier and leader rest situation. Degree of acclimatization to environment. Impact of new leaders and crewmembers.
<b>TIME AVAILABLE</b> Time available for planning and rehearsals. Time available to conduct the mission.
<b>CIVIL CONSIDERATIONS</b> Applicable ROE and ROI. Potential stability and support operations involving contact with civilians (such as NEOs, refugee or disaster assistance, or counterterrorism). Potential for media contacts or inquiries.

**Table D-2. Examples of potential hazards.**

## **D-2. STEP 2, ASSESS HAZARDS TO DETERMINE RISKS**

Hazard assessment is the process of determining the direct impact of each hazard on an operation (in the form of hazardous incidents).

- a. Determine which hazards can be eliminated or avoided.
- b. Assess each hazard that cannot be eliminated or avoided to determine the probability that the hazard will occur.
- c. Assess the severity of hazards that cannot be eliminated or avoided. Severity, defined as the result or outcome of a hazardous incident, is expressed by the degree of

injury or illness (including death), loss of or damage to equipment or property, environmental damage, or other mission-impairing factors (such as unfavorable publicity or loss of combat power).

d. Taking into account both the probability and severity of a hazard, determine the associated risk level (extremely high, high, moderate, or low). Table D-3 summarizes the four risk levels.

e. Based on the factors of hazard assessment (probability, severity, and risk level, as well as the operational factors unique to the situation), complete risk management worksheet. (Refer to FM 100-14 for an example of a completed risk management worksheet.)

RISK LEVEL	MISSION EFFECTS
Extremely high (E)	Mission failure if hazardous incidents occur in execution.
High (H)	Significantly degraded mission capabilities in terms of required mission standards. Not accomplishing all parts of the mission or not completing the mission to standard (if hazards occur during mission).
Moderate (M)	Expected degraded mission capabilities in terms of required mission standards. Reduced mission capability (if hazards occur during the mission).
Low (L)	Expected losses have little or no impact on mission success.

**Table D-3. Risk levels and impact on mission execution.**

### **D-3. STEP 3, DEVELOP CONTROLS AND MAKE RISK DECISIONS**

Step 3 consists of two substeps: develop controls and make risk decisions. This step is done during the COA development, COA analysis, COA comparison, and COA approval steps of the military decision-making process.

a. **Develop Controls.** Controls are the procedures and considerations the unit uses to eliminate hazards or reduce their risk. After assessing each hazard, develop one or more controls that will either eliminate the hazard or reduce the risk (probability, severity, or both) of potential hazardous incidents. When developing controls, consider the reason for the hazard, not just the hazard itself.

b. **Make Risk Decisions.** A key element in the process of making a risk decision is determining whether accepting the risk is justified or, conversely, is unnecessary. The decision-maker must compare and balance the risk against mission expectations, then decide if the controls are sufficient and acceptable and whether to accept the resulting residual risk. If the risk is determined unnecessary, the decision-maker directs the development of additional controls or alternative controls; as another option, he can modify, change, or reject the selected COA for the operation.

### **D-4. STEP 4, IMPLEMENT CONTROLS**

Implementing controls is the most important part of the risk management process. It is the chain of command's contribution to the safety of the unit. Implementing controls includes coordination and communication with appropriate superior, adjacent, and

subordinate units and with individuals executing the mission. The TF commander must ensure that specific controls are integrated into OPLANs, OPORDs, SOPs, and rehearsals. The critical check for this step is to ensure that controls are converted into clear, simple execution orders understood by all levels. If the leaders have conducted a thoughtful risk assessment, the controls will be easy to implement, enforce, and follow. Examples of risk management controls include the following:

- Thoroughly brief all aspects of the mission, including related hazards and controls, and ensure that subordinates know the plan.
- Allow adequate time for rehearsals at all levels.
- Drink plenty of water, eat well, and get as much sleep as possible (at least 4 hours in any 24-hour period).
- Enforce speed limits, use of seat belts, and driver safety.
- Establish recognizable visual signals and markers to distinguish maneuvering units.
- Enforce the use of ground guides in assembly areas and on dangerous terrain.
- Limit single-vehicle movement.
- Establish SOPs for the integration of new personnel.

#### **D-5. STEP 5, SUPERVISE AND EVALUATE**

During mission execution, leaders must ensure their subordinates properly understand and execute risk management controls. Leaders must continuously evaluate the unit's effectiveness in managing risks to gain insight into areas that need improvement.

a. **Supervision.** Leadership and unit discipline are the keys to ensuring implementation of effective risk management controls. All leaders are responsible for supervising mission rehearsals and execution to ensure standards and controls are enforced. In particular, NCOs must enforce established safety policies as well as controls developed for a specific operation or task. Techniques include spot checks, inspections, SITREPs, confirmation briefs, and supervision. During mission execution, leaders must continuously monitor risk management controls to determine whether they are effective and to modify them as necessary. Leaders must also anticipate, identify, and assess new hazards. They ensure that imminent danger issues are addressed on the spot and that ongoing planning and execution reflect changes in hazard conditions.

b. **Evaluation.** Whenever possible, the risk management process should also include an after-action review to assess unit performance in identifying risks and preventing hazardous situations. Leaders should then incorporate lessons learned from the process into unit SOPs and plans for future missions.

c. **Commander's Guidance.** The TF commander gives the company team commanders and staff direction, sets priorities, and establishes the command climate (values, attitudes, and beliefs). Successful preservation of combat power requires him to imbed risk management into individual behavior. To fulfill this commitment, the commander must exercise creative leadership, innovative planning, and careful management. Most importantly, he must demonstrate support for the risk management process. The commander and others in the chain of command can establish a command climate favorable to risk management integration by taking the following actions:

- Demonstrating consistent and sustained risk management behavior through leading by example and stressing active participation throughout the risk management process.
- Providing adequate resources for risk management. Every leader is responsible for obtaining the assets necessary to mitigate risk and for providing them to subordinate leaders.
- Understanding their own and their soldier's limitations, as well as their unit's capabilities.
- Allowing subordinates to make mistakes and learn from them.
- Preventing a "zero defects" mindset from creeping into the unit's culture.
- Demonstrating full confidence in subordinates' mastery of their trades and their ability to execute a chosen COA.
- Keeping subordinates informed.
- Listening to subordinates.

d. **Leader Responsibility.** For the commander, his subordinate leaders, and individual soldiers alike, responsibilities in managing risk include the following:

- Make informed risk decisions; establish and then clearly communicate risk decision criteria and guidance.
- Establish clear, feasible risk management policies and goals.
- Train the risk management process. Ensure that subordinates understand the who, what, when, where, and why of managing risk and how these factors apply to their situation and assigned responsibilities.
- Accurately evaluate the unit's effectiveness, as well as subordinates' execution of risk controls during the mission.
- Inform higher headquarters when risk levels exceed established limits.

## **Section II. FRATRICIDE AVOIDANCE**

Fratricide avoidance is a complex problem defying simple solutions. Fratricide can be defined broadly as employing friendly weapons and munitions with the intent of killing the enemy or destroying his equipment or facilities but resulting in unforeseen and unintentional death or injury to friendly personnel. This section focuses on actions leaders can take to reduce the risk and occurrence of fratricide using current resources.

### **D-6. MAGNITUDE OF THE PROBLEM**

The modern battlefield is more lethal than any in history. The tempo of operations is rapid, and the nonlinear nature of the battlefield creates command and control challenges for unit leaders. The accuracy and lethality of modern weapons make it possible to engage and destroy targets at extended ranges. However, the ability of US forces to acquire targets using thermal imagery and other sophisticated sighting systems exceeds its capability to identify these targets accurately. Consequently, friendly elements can be engaged unintentionally and destroyed in a matter of seconds. Added to this is battlefield obscuration, which becomes a critical consideration whenever thermal sights are the primary source of target identification. Rain, dust, fog, smoke, and snow degrade identification capability by reducing the intensity and clarity of thermal images. On the battlefield, positive visual identification cannot be the sole engagement criteria at ranges

beyond 1,000 meters. The common operational picture is essential and must be maintained throughout any operation.

#### **D-7. RISK IDENTIFICATION AND PREVENTIVE MEASURES**

Reduction of fratricide risk begins during the planning phase of an operation and continues through preparation and execution. Risk identification must be conducted at all levels during each phase, and the results clearly communicated up and down the chain of command, so risk assessment can begin. The following paragraphs cover considerations influencing risk identification and focuses on measures the leader can implement to make the identification process more effective and help prevent friendly fire incidents from occurring.

#### **D-8. PLANNING PHASE**

A thoroughly developed, clearly communicated, and completely understood plan helps minimize fratricide risk. The following factors affect the potential for fratricide in a given operation:

- Clarity of the enemy situation.
- Clarity of the friendly situation.
- Clarity of the commander's intent.
- Complexity of the operation.
- Planning time available at each level.

Graphics are a basic tool commanders at all levels use to clarify their intent, add precision to their concept, and communicate their plan to subordinates. Graphics can be a very useful tool in reducing the risk of fratricide. Each commander must understand the definitions and purposes of operational graphics and the techniques of their employment. (See FM 101-5-1 for the definitions of each type of graphic control measure.)

#### **D-9. PREPARATION PHASE**

Confirmation briefs and rehearsals are primary tools for identifying and reducing fratricide risk during the preparation phase. The following are considerations for their use:

- a. Confirmation briefs and rehearsals ensure subordinates know where fratricide risks exist and what to do to reduce or eliminate them.
- b. Briefbacks ensure subordinates understand the commander's intent. They often highlight areas of confusion or complexity, or planning errors.
- c. The type of rehearsal conducted determines the types of risks identified.
- d. Rehearsals should extend to all levels of command and involve all key players.
- e. The following factors may reveal fratricide risks during rehearsals:
  - Number and type of rehearsals.
  - Training and proficiency levels of units and individuals.
  - The habitual relationships between units conducting the operation.
  - The physical readiness (endurance) of the troops conducting the operation.

**D-10. EXECUTION PHASE**

During execution, in-stride risk assessment and reaction can overcome unforeseen fratricide risk situations.

- a. The following are factors to consider when assessing fratricide risks:
  - Intervisibility between adjacent units.
  - Amount of battlefield obscuration.
  - Ability or inability to identify targets positively.
  - Similarities and differences in equipment, vehicles, and uniforms between friendly and enemy forces.
  - Vehicle density on the battlefield.
  - The tempo of the battle.
- b. Maintaining the COP at all levels and at all times is another key to fratricide reduction as an operation progresses. Units develop and employ effective techniques and SOPs to aid leaders and crewmen in this process, to include--
  - Monitoring the next higher radio net.
  - Radio cross-talk between units.
  - Accurate position reporting and navigation.
  - Training, use, and exchange of liaison officers.

**D-11. FRATRICIDE REDUCTION MEASURES**

The following measures provide a guide to actions that can reduce fratricide risk. Use of these measures is not required, and they are not intended to restrict initiative. Apply them as appropriate based on the specific situation and METT-TC factors:

- a. Identify and assess potential fratricide risks in the estimate of the situation. Express these risks in the OPORD or FRAGO.
- b. The unit leadership must focus on areas such as current intelligence, unit locations and dispositions, denial areas (minefields and FASCAM), contaminated areas such as ICM and NBC, SITREPs, and METT-TC factors.
- c. Ensure positive target identification. Review vehicle and weapon ID cards. Know at what ranges and under what conditions positive identification of friendly vehicles and weapons is possible.
- d. Establish a command climate that stresses fratricide prevention. Enforce fratricide prevention measures and emphasize the use of doctrinally sound tactics, techniques, and procedures. Ensure constant supervision in the execution of orders and the performance of all tasks and missions to standard.
- e. Recognize the signs of battlefield stress. Maintain unit cohesion by taking quick, effective action to alleviate it.
- f. Conduct individual, leader, and collective (unit) training covering fratricide awareness, target identification and recognition, and fire discipline.
- g. Develop a simple, decisive plan.
- h. Give complete and concise mission orders.
- i. Use SOPs that are consistent with doctrine to simplify mission orders. Periodically review and change SOPs as needed.
- j. Strive for maximum planning time for you and your subordinates.



- k. Use common language and vocabulary and doctrinally correct standard terminology and control measures, such as fire support coordination line, zone of engagement, and restrictive fire lines.
  - l. Ensure thorough coordination is conducted.
  - m. Plan for and establish effective communications (to include visual).
  - n. Plan for collocation of command posts whenever it is appropriate to the mission, such as during a passage of lines.
    - o. Designate and employ LNOs as appropriate.
    - p. Ensure rules of engagement are clear.
    - q. Include fratricide risk as a key factor in terrain analysis (OCOKA).
    - r. Conduct rehearsals whenever the situation allows time to do so.
    - s. Be in the right place at the right time. Use position location and navigation devices (GPS and position navigation [POSNAV]); know your location and the locations of adjacent units (left, right, leading, and follow-on) through use of FBCB2 and other means. Synchronize tactical movement.
    - t. Plan and brief OPSEC, especially when utilizing dismounted operations (challenge and password, sign and countersign).
    - u. Include discussion of fratricide incidents in AARs.
    - v. Ensure fire commands are accurate, concise, and clearly stated. Make it mandatory for soldiers to ask for clarification of any portion of the fire command that they do not completely understand.
    - w. Stress the importance of the chain of command in the fire control process; ensure soldiers get in the habit of obtaining target confirmation and permission to fire from their leaders before engaging targets they assume are enemy elements.
    - x. Know who will be in and around the area of operations.

#### **D-12. FRATRICIDE RISK CONSIDERATIONS**

Table D-4, which parallels the five-paragraph OPORD, contains key factors and considerations in fratricide prevention. This is not a change to the OPORD format, but is a guide for use during OPORD development to ensure fratricide prevention measures are included. It is not a strict directive. The factors and considerations are listed where they would likely appear in the OPORD, but they may warrant evaluation during preparation of other paragraphs.

##### **Task Organization:**

- Has the unit worked under this task organization before?
- Are SOPs compatible with the task organization (especially with attached units)?
- Are special markings or signals (for example, cats' eyes, chemlights, or panels) needed for positive identification of uniforms and equipment?
- What special weapons and equipment are to be used? Do they look or sound like enemy weapons and equipment?

**Table D-4. Fratricide prevention checklist.**

**1. Situation.****a. Enemy Forces.****(1) Weather:**

- What are the expected visibility conditions (light data and precipitation) for the operation?
- What effects will rain, heat, and cold have on soldiers, weapons, and equipment?

**(2) Terrain:**

- Do you know the topography and vegetation (urban, mountainous, hilly, rolling, flat, desert, swamp/marsh, prairie/steppe, jungle, or open woods) of the expected AO?
- Have you evaluated the terrain using the factors of OCOKA?

**b. Friendly Forces.**

- Among the allied forces, are there differences (or similarities with enemy forces) in language, uniform, and equipment that could increase fratricide risk during combined operations?
- Could differences in equipment and uniforms among US armed forces increase fratricide risk during joint operations?
- What differences in equipment and uniforms can leaders stress to help prevent fratricide?
- What is the friendly deception plan?
- What are the locations of your unit and adjacent units (left, right, leading, and follow-on)?
- What are the locations of neutrals and noncombatants?
- What are the locations of your own forces?
- What is the status of training activities?
- What are the levels of individual, crew, and unit proficiency?
- Will fatigue be a factor for friendly forces during the operation? Has an effective sleep plan been developed?
- Are friendly forces acclimatized to the AO?
- What is the age (new, old, or mixed) and condition of equipment in friendly units?
- What is the status of new equipment training?
- What are the expected MOPP requirements for the operation?

**c. Attachments and Detachments.**

- Do attached elements understand pertinent information regarding enemy and friendly forces?
- Will gaining units provide this pertinent information to detached elements?
- Are communications systems compatible (digital/analog)?

**2. Mission.** Do all elements clearly understand the mission and all associated tasks and purposes?**Table D-4. Fratricide prevention checklist (continued).**

### 3. Execution.

#### a. *Concept of the Operation.*

(1) *Maneuver*: Are main and supporting efforts identified?

(2) *Fires (Direct and Indirect)*:

- Are priorities of fires identified?
- Have target lists been developed?
- Have the fire execution matrix and overlay been developed?
- Have locations of denial areas (minefields and FASCAM) and contaminated areas (ICM and NBC) been identified?
- Are the locations of all supporting fire targets identified in the OPORD and OPLAN overlays?
- Are aviation and CAS targets clearly identified?
- Has the direct fire plan been developed?
- Have FPFs been designated?
- Are the requirements for accurate predicted fire met or do we have to adjust fire?

(3) *Engineer Tasks*:

- Are friendly minefields, including FASCAM and ICM dud-contaminated areas, known?
- Have obstacles and the approximate time needed for reduction or breaching of each been identified?

(4) *Tasks to Each Subordinate Unit*: Are friendly forces identified, as appropriate, for each subordinate maneuver element?

(5) *Tasks to CS and CSS Units*: Have locations of friendly forces been reported to CS and CSS units?

#### b. *Coordinating Instructions.*

- Will rehearsals be conducted? Are they necessary? Are direct and indirect fires included?
- Is a confirmation brief necessary?
- Are appropriate control measures clearly explained and illustrated in the OPORD and overlays? Have they been disseminated to everyone who has a need to know? What is the plan for using these control measures to synchronize the battle and prevent fratricide?
- Are the locations for division and corps slice elements in the brigade battle space posted and disseminated?
- Have target and vehicle identification drills been practiced?
- Do subordinate units know the immediate action, drill, or signal for “CEASE FIRE” and “I AM FRIENDLY” if they come under unknown or friendly fire? Is there a backup?
- Is guidance in handling dud munitions, such as ICM and cluster bomb units (CBU), included?

**Table D-4. Fratricide prevention checklist (continued).**

4. **Service Support.**
  - Does everyone know train locations and identification markings?
  - Do medical and maintenance personnel know the routes between train units?
5. **Command and Signal.**
  - a. **Command.**
    - What are the locations of the commander and key staff members?
    - What are the chain of command and the succession of command?
  - b. **Signal.**
    - Do instructions include backup code words and visual signals for all special and emergency events?
    - Do instructions cover how to identify friendly forces to aircraft?
    - Do they include backup code words and visual signals for all special and emergency events?
    - Are SOI distributed to all units with a need to know, such as higher, lower, adjacent, leading, and follow-on elements?

**Table D-4. Fratricide prevention checklist (continued).**

### **Section III. CONTINUOUS OPERATIONS**

The battalion task force often operates for extended periods of time in continuous operations. Continuous operations are combat operations continuing at the same high intensity level for extended periods. (For more information on the effects of continuous operations refer to FM 6-22.5.) Leaders and soldiers may have opportunities for sleep, but this sleep may be brief or fragmented and there likely will be periods of sustained operations characterized by very little opportunity for leaders and soldiers to get more than a few minutes of sleep. This continuous cycle of day and night operations and the associated stress of combat cause degradation in performance over time. Reducing this impact on performance is a significant challenge for the C2 system.

#### **D-13. EFFECTS OF CONTINUOUS OPERATIONS**

Continuous operations force leaders and soldiers to perform under adverse conditions that cause degradation in performance. The most significant factor leading to this degradation is the loss of sleep. Table D-5 shows the effects of sleep loss. Other contributing factors include low light levels, limited visibility, disrupted sleep routines, physical fatigue, and stress.

<b>AFTER 24 HOURS</b>	A deterioration in performance of tasks that are inadequately or newly learned, that are monotonous, or that require vigilance.
<b>AFTER 36 HOURS</b>	A marked deterioration in ability to register and understand information.
<b>AFTER 72 HOURS</b>	Performance on most tasks will be about 50 percent of normal.
<b>3 TO 4 DAYS</b>	The limit for intensive work including mental and physical elements. Visual illusions are likely at this stage, or earlier, especially in NBC.
<b>BETWEEN 0300 &amp; 0600 HOURS</b>	Performance is at its lowest ebb.

**Table D-5. Effects of sleep loss.****D-14. INDICATORS OF SLEEP DEPRIVATION AND FATIGUE**

To minimize the effects of sleep loss, all commanders must be able to recognize the signs of sleep loss and fatigue. Table D-6 shows the indicators of sleep deprivation and fatigue.

<b>PHYSICAL CHANGES</b>	Body swaying when standing. Vacant stares. Pale skin. Slurred speech. Bloodshot eyes.
<b>MOOD CHANGES</b>	Less energetic, alert, and cheerful. Loss of interest in surroundings. Possible depressed mood or apathetic and more irritable.
<b>EARLY MORNING DOLDRUMS</b>	Requires more effort to do a task in the morning than in the afternoon, especially between 0300 and 0600.
<b>COMMUNICATION PROBLEMS</b>	Unable to carry on a conversation. Forgetfulness. Difficulty in speaking clearly.
<b>DIFFICULTY PROCESSING INFORMATION</b>	IN Slow comprehension and perception. Difficulty in accessing simple situations. Requiring longer to understand information.
<b>IMPAIRED ATTENTION SPAN</b>	Decreased vigilance. Failure to complete routines. Reduced attention span. Short-term memory loss. Inability to concentrate.

**Table D-6. Indicators of sleep deprivation and fatigue.**

**D-15. REDUCING THE IMPACT OF CONTINUOUS OPERATIONS**

Table D-7 shows the measures that may reduce the negative impacts of continuous operations.

SLEEP SCHEDULING		COUNTERMEASURES
ADEQUATE	4 hours of continuous sleep in every 24 hours (likely to maintain adequate performance over several weeks).	Give simple, precise orders. Increase use of written orders. Crosscheck. Plan more time for completion of all tasks. Enforce adequate food and water intake. Develop and enforce sleep plans. Good physical fitness slows the effects of sleep loss and fatigue. Increase use of confirmation briefs.
SLEEP WAKEFULNESS	A small amount of sleep relative to that lost is beneficial.	
RECOVERY	10 hours uninterrupted sleep required for full recovery after 48-72 hours without sleep.	
CATNAPS (10 TO 30 MINUTES)	Catnaps are beneficial, but the only truly effective remedy is sleep.	
TIMING	Consistent timing of sleep and wakeup times will contribute to successful adjustment to an arduous regimen.	
NOTE: After 48-72 hours without sleep, soldiers become militarily ineffective. After 5 to 7 days of partial sleep deprivation, alertness and performance decline to the same low level as seen following 2 to 3 days without sleep.		

**Table D-7. Reducing the impact of continuous operations.**

**D-16. SLEEP DENIAL**

Commanders and leaders often regard themselves as being the least vulnerable to fatigue and the effects of sleep loss. Tasks requiring quick reaction, complex reasoning, and detailed planning, however, make leaders the most vulnerable to the effects of sleep deprivation. Leaders must sleep. The display of sleep denial as an example of self-control by leaders is extremely counterproductive.